National Surveillance Unit March 5, 2004

Prioritizing Surveillance Activities

Though the consequences of inadequate surveillance could be catastrophic, the resources to accomplish surveillance activities are not unlimited. For this reason and many others including the desire to be fiscally responsible it is necessary to prioritize surveillance activities. The National Surveillance Unit (NSU) has been created and tasked with helping to achieve an integrated and comprehensive surveillance system for the U.S. To do that the NSU must have a list of the highest priority surveillance activities to begin work on. Without such a list the unit will be subjected to a barrage of requests and it will be difficult to develop an intermediate term plan with specific goals.

The following is an outline of a suggested approach to prioritizing surveillance activities.

Step 1: Selection of prioritization working group

The selection of a prioritization group will be very important to obtain buy-in from all the affected groups and to accurately reflect the areas of highest need. At the same time the group must have enough knowledge of U.S. agriculture in general and disease surveillance to adequately weigh the needs and trade-offs for surveillance. The group should be large enough to have a broad perspective relative to the animal industries and official needs for international and domestic commerce and disease control. At the same time the group must be small enough to achieve consensus in a reasonable period of time.

Step 2: Identify the evaluation criteria

To lend some order to the prioritization process some agreement on the criteria is essential. There are many potential criteria that could be used but a core set must be established to keep the process manageable. However, the evaluation criteria should include all the categories with the greatest impact on producers and the production process. Of necessity some of these will relate directly to economic returns to the producer. Factors that contribute immediately to producer returns include individual animal production measures as well as the ability to trade internationally. For some commodities the presence of an international market for live animals or product can have profound impacts on prices and in turn returns. For other commodities this impact may be less pronounced.

Potential areas for consideration:

Impact on productivity

The impact of productivity should be considered at the industry level. The overall impact will be a function of the frequency of occurrence (prevalence and incidence) and the severity of the condition that is reflected in the production of the affected animals. In addition, the cost of control could be considered such that the impact on productivity reflects the net returns to the producers.

Animal welfare concerns

In the U.S. and in Europe animal welfare is achieving a higher profile with producers and consumers. As with impacts on productivity, animal welfare concerns will likely be a reflection of the occurrence of disease problems and their severity.

Importance in animal export

The U.S. continues to cultivate international markets for animals and animal products. Access to these markets often depends on certifications with regard to animal health status in the U.S. and potentially other criteria such as production practices. Since the requirements often vary depending on the desire to export live animals v. animal products these criteria should be considered separately. In addition, the value of the markets for live animals v. animal products can be markedly different depending on the commodity. This factor is meant to capture the importance of documentation of the named disease agent in gaining/maintaining access to export markets.

Importance in animal product export

As discussed above the export market is increasingly import for U.S. producers. This factor is meant to gauge the importance of documentation of the U.S. status relative to the disease agent in gaining/maintaining access to export markets for products from U.S. animals. (Note that domestic markets are meant to be assessed through the criteria of 'Public Health Implications' and 'Animal Welfare Concerns' that are likely to affect domestic consumption to some extent. While animal disease conditions can also affect product quality and ultimately domestic consumption, these are not captured here.)

Feasibility of control

Surveillance is meant to gather information so that action can be taken. One of those actions might be focused on control or elimination of the disease agent. For disease agents that are amenable to control this factor should be weighed into the equation prioritizing diseases for surveillance. This factor should reflect the overall ease of control at the aggregate industry level. The inability to control or eliminate the disease agent should not preclude surveillance as it may still be important in assessing the impacts and any downstream mitigation strategies.

Low cost of control/surveillance

While the cost of surveillance and control should not be the main driving force for doing surveillance ease of conducting surveillance for certain disease agents should at least be considered. This is analogous to 'picking the low hanging fruit'. Disease conditions with low surveillance

costs should score high on this criterion. This could occur samples/data are collected for other purposes and could be subjected to additional testing at relatively little additional cost.

Public health implications

While no group would intentionally produce products that are not wholesome to consumers, the threat (real or perceived) of a public health problem associated with presence of a disease agent in the animal population could drastically affect the marketability of products both domestically and internationally.

Step 3: Identify the relative importance of each of the evaluation criteria.

Since the weighting given to each of the evaluation criteria will be critical in determining the relative importance of the diseases or conditions to be under surveillance this step should be carefully conducted.

Step 4: Determine the ranking categories.

Each disease or condition can be ranked within an evaluation criterion. Too few ranking categories results in little separation of the conditions. Too many ranking categories would likely lead to difficulty in achieving consensus. It is suggested that 3 to 5 ranking categories be used. Further it is suggested that these rankings be linearly related (ie. low = 1, medium = 2, and high = 3) rather than attempting to apply weighting within a category.

Step 5: Determine the conditions eligible for prioritization.

Some core list of conditions to be considered would have to be developed. Some candidate lists exist, such as the current OIE lists, as starting points. Most of these candidate lists are disease agent oriented which could be seen as a shortcoming. It is true that in some cases multiple disease agents could be handled within a single surveillance system for little added marginal cost. However, the grouping of disease conditions and the evaluation of added marginal cost can be handled in step 6 of the process. This approach could still be used to accommodate disease syndromes though one must guard against an extreme loss in focus of the system in accommodating syndromes rather than specified disease agents. Most of the existing lists of high priority agents are focused on infectious disease agents. Efforts should be made to include non-infectious disease agents where these are appropriate.

Step 6: Achieve consensus on the ranking of each condition for each criterion.

It is likely that this process will be very interactive. While an initial attempt could be made allowing each member of the prioritization team to place each condition in the matrix it is likely that there will be some significant differences of opinion among the group for how the conditions should be ranked. After adequate discussion the group must achieve some consensus.

Step 7: Evaluate the suggested priorities.

The final step in the process is to evaluate the suggested priorities. Several questions can be asked at this point.

1. Are there areas of need that have been missed?
    a. Mandatory surveillance initiatives that have not been included.
    b. Newly emerging surveillance needs.
    c. Areas that have been overlooked.
2. What are the expected costs or budget allocations for each of these objectives?
    a. Provides a guideline for the design phase of the project.
    b. Determines the starting list for design consideration.

As surveillance programs are designed to address the highest priority areas consideration can be given to the marginal cost of adding other surveillance objectives to the highest priority objectives. It may well be some lower priority surveillance needs can be addressed at little additional cost through programs designed for the highest priority objectives. In this case the initial prioritization process can be seen as developing the backbone for surveillance.

After the prioritization process the rankings can be validated externally to obtain broader stakeholder input. In this phase more information may come to light that would influence the overall rankings of some named disease agents. However, it would be hoped that little new information would come out to suggest any changes to the rankings. In that case the external validation would serve as the first step in an education/communication process to the stakeholders regarding the expected activities of the NSU and the agency with regard to surveillance of named/known disease agents.

This process is targeted at named/known disease agents. As such emerging disease conditions would not necessarily factor into this process. At the point that the emerging disease process was understood sufficiently to characterize the etiology of the condition then it would be eligible for this prioritization process. This would then necessitate a separate process to do surveillance for emerging disease conditions and identify the ecology and impact of these conditions to weigh them in the process outlined above.

Conditions continue to change. A periodic review/revisit to the prioritization will be necessary to assure on-going work on truly the highest priority items. This review should occur at long enough intervals to allow good progress in the areas ranked at the highest priorities. However, there should be some opportunity for flexibility in the system to respond to a changing context for surveillance such as a change in international reporting requirements or a change in the domestic animal health status. An annual review of the prioritization process (criteria and weighting factors), candidate condition list, and actual prioritization would seem to be a good starting point.

Example Matrix for Prioritization of Surveillance Initiatives

		Potential Public Health Impact	Production Impact	Feasibility of Control Pre-harvest	Priority Based on Low Cost of Control/Surveillance	Impact on Trade of Products	Impact on Trade of Animals
	Weight Factor	2	1	1	1	.5	.25
High	3	BSE		BSE		BSE	BSE
Medium	2	Salmonella			BSE		
Low	1		Salmonella BSE	Salmonella	Salmonella	Salmonella	
None	0						Salmonella

Each of the potential evaluation criteria (columns) can be weighted by some appropriate factor.
Disease agents are assigned to a score level (rows) within each criterion (column).
For each disease an overall score is determined by taking the score and multiplying by the weighting factor.
For example, the overall score for BSE would be;
3*2 +1*1 +3*1 + 2*1 +3*.5 + 3*.25 = 14.25
In contrast the score for Salmonella would be;
2*2 + 1*1 + 1*1 + 1*1 + 1*.5 + 0*.25 = 7.5